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| APPLICATION NO.            | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------|-------------|----------------------|---------------------|------------------|
| 09/364,241                 | 07/29/1999  | ROBERT P. PARKER     | 02103/349001        | 9138             |
| 26162                      | 7590        | 08/08/2005           | EXAMINER            |                  |
| FISH & RICHARDSON PC       |             |                      | TRAN, KHANH C       |                  |
| P.O. BOX 1022              |             |                      | ART UNIT            |                  |
| MINNEAPOLIS, MN 55440-1022 |             |                      | PAPER NUMBER        |                  |

2631

DATE MAILED: 08/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/364,241             | PARKER, ROBERT P.   |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Khanh Tran             | 2631                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05/24/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The Appeal Brief filed on 05/24/2005 has been entered. Claims 1-15 are pending in this Office action.

### ***Response to Arguments***

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Claim Objections***

3. Claim 1 is objected to because of the following informalities: in line 6 "and" should be changed to -- or --; in line 7, "and" should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the threshold frequency **cannot** be less **and** more than the received frequency **at the same time**. The threshold frequency **should** be less **or** more than the received frequency.

4. Claim 2 is objected to because of the following informalities: in line 6 "and" should be changed to -- or --; in line 7, "and" should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the threshold frequency **cannot** be less **and** more than the received frequency **at the same time**. The threshold frequency **should** be less **or** more than the received frequency.

5. Claim 3 is objected to because of the following informalities: in line 6 “and” should be changed to -- or --; in line 7, “and” should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the threshold frequency **cannot** be less **and** more than the received frequency **at the same time**. The threshold frequency **should** be less **or** more than the received frequency.

6. Claim 4 is objected to because of the following informalities: in line 3 “and” should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the received frequency **cannot** be greater than **and** less than the threshold frequency **at the same time**.

7. Claim 8 is objected to because of the following informalities: in line 6 “and” should be changed to -- or --; in line 7, “and” should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the threshold frequency **cannot** be less **and** more than the received frequency **at the same time**. The threshold frequency **should** be less **or** more than the received frequency.

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8. Claim 9 is objected to because of the following informalities: in line 6 "and" should be changed to -- or --; in line 7, "and" should be changed to -- or --. Appropriate correction is required.

Comments: claim is objected because the threshold frequency cannot be less and more than the received frequency at the same time. The threshold frequency should be less or more than the received frequency.

9. Claim 11 is objected to because of the following informalities: in line 8 "a local oscillator, for providing a local oscillator signal" should be deleted. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-11, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belisomi U.S. Patent 4,142,158 in view of Skerlos U.S. Patent 4,163,259.

Regarding claim 1, a television or radio receiver having electronic means for selecting the frequency to which the receiver is to be tuned, in which the

selection is effected by means of a voltage controlled oscillator controlled by a control loop.

Referring now to FIG. 1 of the drawings, in column 3, lines 10-25, there are shown the main blocks of the device for tuning a television receiver to a selected channel. This device comprises an voltage controlled oscillator 1 the frequency of which can be controlled by applying a control voltage to a control terminal 3, and which supplies to a first output terminal 2 a persistent oscillation which is fed to a mixing circuit of conventional type (not shown in the drawing). In light of the foregoing teachings, the receiver receives an electromagnetic signal having a frequency tuned to the selected frequency.

In column 3 line 65 via column 4 line 30, depression of one of the keys of the keyboard 14 recalls from the memory a number corresponding to the channel selected by that or those keys, and this number is fed as a control signal to the programmable divider 6 to control this to divide the signal generated by the voltage controlled oscillator 1 and already divided down by the divider 5, by a given number which is such that the frequency of the reference signal from the oscillator 9, multiplied by this number, corresponds, to a factor, to the nominal frequency of the chosen channel. The output voltage from the comparator 8 then controls the control loop to cause the frequency of the signal from the programmable divider 6 to coincide with the reference frequency, thereby ensuring the perfect tuning of the receiver to the required channel.

In light of the aforementioned teachings, the frequency of the reference signal from the oscillator 9 corresponds to the claimed "threshold frequency" and the output from programmable divider 6 corresponds to the claimed "desired received signal". The frequency comparator 8 performs the comparison step of the desired received signal to a threshold frequency as claimed in the patent application.

Belisomi does not teach tuning the oscillator of the receiver to a frequency within the range of reception frequencies based on the threshold frequency, that is less and more than the received frequency when the received frequency is above and below the threshold frequency, respectively as claimed in the application claim.

Skeros teaches a "window" type channel tuning system for use in television receiver, wherein the receiver is automatically tuned to a restricted frequency "window" about the nominal carrier frequency of the desired channel; see column 1, lines 15-30 and column 2, lines 5-15. In light of the foregoing disclosure, the frequency "window" corresponds to the claimed "frequency range" and the nominal carrier frequency of the desired channel corresponds to the claimed "threshold frequency". In column 3, lines 40-65, Skeros discusses a conventional technique in which Skeros teachings are relied on for tuning accuracy. In conventional television receivers, the frequency of the IF signal can be used as an indication of receiver tuning accuracy. Specifically, the frequency of the IF signal is 45.75 MHz when the tuner is accurately tuned to the carrier

frequency of a received television signal. Any deviation from proper tuning results in the frequency of the IF signal deviating from this nominal frequency. In view of that, it would have been obvious for one of ordinary skill in the art at the time of the invention that Belisomi receiver can be modified to track the frequency of the IF signal is 45.75 MHz as taught in the conventional television receivers. Motivation is that tracking and using the received IF frequency as a tuning indication is known much more accurate.

According to the aforementioned conventional technique, any deviation from proper tuning results in the frequency of the IF signal deviating from this nominal frequency, which is the frequency of reference signal. In view of that, the frequency of the IF signal, e.g. 45.75 MHz, corresponds to the frequency of reference signal. Tuning occurs when the frequency of the IF signal deviating from this nominal frequency respectively.

Regarding claim 2, claim 2 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, referring to Belisomi invention, in column 3 line 55 via column 4 line 15, memory 7 stores all the numbers corresponding to desired channels. In view that, the desired received channel is converted to an index number as claimed in the application claim.

Regarding claim 3, claim 3 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, Belisomi does not teach "further representing



the threshold frequency as an index value of a set of index values as set forth in the claim. However, because the desired received channels are stores in the memory 7 as index values, it would have been obvious for one of ordinary skill in the art at the time of the invention that the frequencies of the reference signal can be modified to be represented as index values. Motivation is that by representing the frequencies of the reference signal as an index value, the reference oscillator 9 does not have to generate various high frequencies. The oscillator 9 only need to generate one single frequency and use the index value to convert it back to the desired frequency of the reference signal.

Regarding claim 4, as recited in claim 1, any deviation from proper tuning results in the frequency of the IF signal deviating from the reference frequency. Deviation from the reference frequency results in frequency offset, which can be correct by tuning, e.g. adding/or subtracting frequency offset, oscillator 1. Deviation from the reference frequency corresponds to the claimed "greater than and less than the threshold frequency".

Regarding claim 5, as recited in claim 1, Skerlos teaches a "window" type channel tuning system for use in television receiver, wherein the receiver is automatically tuned to a restricted frequency "window" about the nominal carrier frequency of the desired channel. In view of that, the restricted frequency "window" corresponds to the frequency range around the center frequency, corresponding to the

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nominal carrier frequency of the desired channel. The range of frequency is bounded by  $F_{low}$  and  $F_{high}$  and the center frequency would be equal to  $(F_{high} - F_{low}) / 2 + F_{low}$  respectively. In view of that, frequency offsets from the nominal carrier frequency of the desired channel includes offsets with the same magnitude.

Regarding claim 6, similar to claim 5, for tuning to the nominal carrier frequency of the desired channel, e.g. center frequency, the frequency offsets are less than or equal to  $(F_{high} - F_{low}) / 2$ , e.g. IF frequency of 45.75 MHz as taught in the conventional television receivers.

Regarding claim 7, according to the conventional television receivers and with "window" type channel tuning system as taught by Skerlos, the frequency offsets (e.g. around the center frequency) are equal to the IF frequency.

Regarding claim 8, claim 8 is rejected on the same ground as for claim 6 because of similar scope.

Regarding claim 9, claim 9 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, Skerlos teachings apply to UHF and VHF receiver. The range of frequencies as claimed in the application claim is within UHF band that covers from 2300 MHz to 2900 Mhz.

Regarding claim 10, claim 10 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, oscillator 1 corresponds to the claimed local oscillator, keyboard 14 corresponds to the claimed source of a signal as set forth in the claim. In column 2, lines 15-40, the control loop is for controlling the output frequency of oscillator 1, the control loop as taught in Belisomi corresponds to the claimed frequency controller.

Regarding claim 11, claim 10 is rejected on the same ground as for claim 1 because of similar scope. Furthermore, as recited in claim 1 of Belisomi invention, the receiver in figure 1 comprises an voltage controlled oscillator 1 the frequency of which can be controlled by applying a control voltage to a control terminal 3, and which supplies to a first output terminal 2 a persistent oscillation which is fed to a mixing circuit of conventional type (not shown in the drawing). In view of that, figure 1 inherently includes a signal path for receiving a signal, and a mixer coupled to oscillator 1 as claimed in the application claim.

Regarding claim 13, claim 13 is rejected on the same ground as for claim 11 and further in view of claim 9 because of similar scope.

11. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Belisomi U.S. Patent 4,142,158 and Skerlos U.S. Patent 4,163,259 and further in view of Sato et al. U.S. Patent 4,021,752.

Belisomi and Skerlos do not teach the local oscillator further comprises a phase locked loop as claimed in the application claim.

In column 2, lines 1-20, according to one aspect of Sato et al. present invention, a local oscillator may be used with a PLL that comprises the local oscillator whose frequency is changed within a predetermined frequency range. Referring to figure 1, a voltage-controlled variable frequency oscillator is used as the local oscillator 4 to produce an oscillation signal in response to the frequency of the received signal and to supply that signal to the mixer 3 and to a variable frequency divider 9. The signal obtained from the variable frequency divider 9 is applied to a phase comparator 10, which also receives a signal from a reference oscillator 11 via a fixed frequency divider 12. The phase comparator 10 compares the phases of the signals from the variable frequency divider 9 and the fixed frequency divider 12 and produces a signal based on the phase difference. This signal is then applied through a low pass filter 13 to a DC amplifier 14. The output signal from the DC amplifier 14 is applied to the local oscillator 4 as a frequency-controlling signal. The PLL includes phase comparator 10, a reference oscillator 11 via a fixed frequency divider 12, a low pass filter 13 to a DC amplifier 14. The local oscillator, corresponding to the claimed local oscillator, includes local oscillator 4 and the PLL as discussed above. Belisomi, Skerlos, and Sato et al. are in the same field of endeavor. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention that Belisomi local oscillator in the receiver can be modified to implement the local oscillator as

taught by Sato et al. Motivation is that as discussed in Sato et al. invention, the PLL circuit and FM feedback are combined to suppress the drift in the local oscillator and to improve the sensitivity of the receiver.

12. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belisomi U.S. Patent 4,142,158 and Skerlos U.S. Patent 4,163,259 and further in view of Kuo et al. U.S. Patent 5,307,515.

Regarding claim 14, claim 14 is rejected on the same ground as for claim 11 because of similar scope. Belisomi and Skerlos do not teach the frequency controller further comprises a microprocessor as claimed.

Kuo et al. invention is directed to a radio receiver with less susceptibility to adjacent channel interference. In figure 1, column 2 line 64 via column 3 line 10, a conventional receiver includes an antenna 10 connected to a radio frequency (RF) amplifier 11. An RF signal is output from RF amplifier 11 and mixed in a mixer 12 with a mixing signal  $f_0$  from a phase-locked loop local oscillator 13. The frequency of mixing signal  $f_0$  is controlled by a microcontroller 14, in response to an external tuning input, and frequency-shifts a desired RF signal from RF amplifier 11 to the intermediate frequency (IF) of the receiver. Belisomi, Skerlos, and Kuo et al. invention are in the same field of endeavor. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention that Belisomi receiver can be modified to implement a microcontroller for frequency control as taught by Kuo et al.. Motivation is that the microcontroller provides speed and more accuracy.

Regarding claim 15, since the microcontroller is part of the frequency controller, as appreciated by one of ordinary skill in the art, the microcontroller can be implemented to store computer instructions for adding or subtracting frequency offsets depending on which way the received IF frequency deviates from the frequency of the reference signal.

### ***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Phanh Cong Tran

08/03/2005

Examiner KHANH TRAN